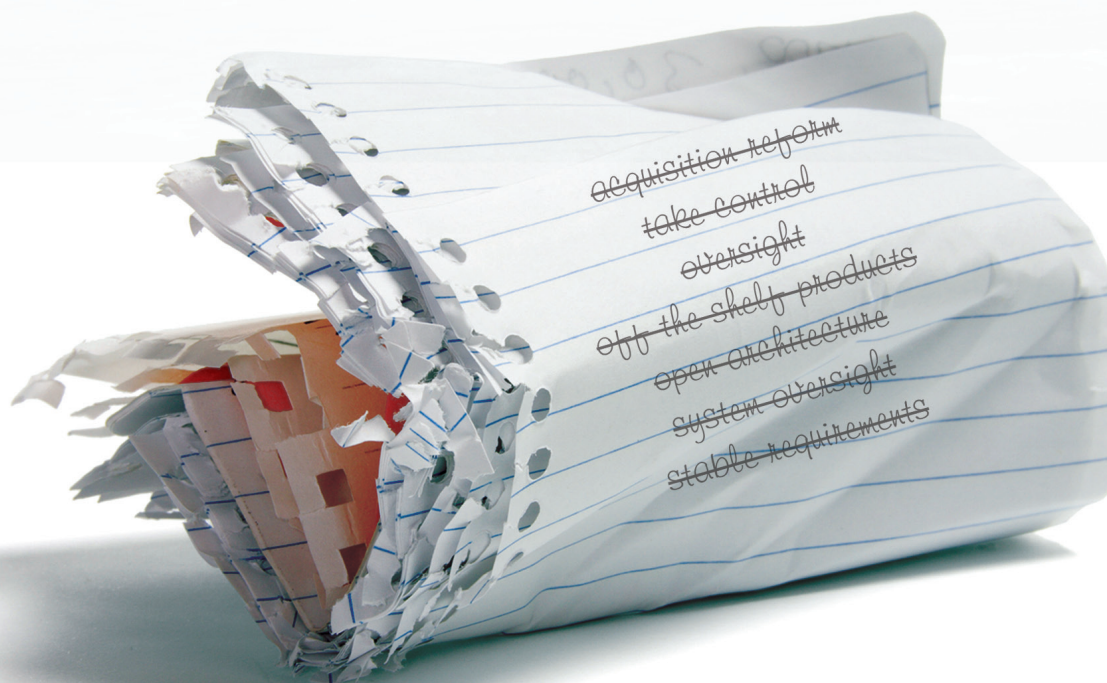




Lessons Learned from the Coast Guard's Acquisition Reform

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Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE AUG 2010		2. REPORT TYPE		3. DATES COVERED 00-07-2010 to 00-08-2010	
4. TITLE AND SUBTITLE Lessons Learned from the Coast Guard's Acquisition Reform				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Defense Acquisition University, Defense AT&L, 9820 Belvoir Road, Fort Belvoir, VA, 22060				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 4	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

The Coast Guard has discovered that success with complex systems acquisition is possible. On July 13, 2007, the U.S. Coast Guard took an important step on its acquisition reform journey when it reached initial operating capability of its reorganized Acquisition Directorate, effectively merging the legacy acquisition organization and the Deepwater Program Executive Office, which oversees the Coast Guard's 25-year plan to replace or refurbish all its equipment. The voyage has been challenging but rewarding, as the Coast Guard has uncovered a number of lessons learned that essentially reinforced proven acquisition best practices and put the Coast Guard appropriately in control while assuming the role as the lead systems integrator for major systems acquisition.

Coast Guard major system acquisition is more important than ever, as its annual appropriation for acquisition, construction, and improvement—funding that is specifically designated for major capital improvements such as the acquisition and rehabilitation of vessels and aircrafts—has tripled over the last decade. Delivering capabilities through goods and services is the fundamental tenant of the Coast Guard's acquisition arm. Without new and refurbished boats, cutters, planes, helicopters, and command and control systems to enable the rescue of distressed boaters, enforcement of laws and regulations, and prosecution of homeland security threats, front line operators would be unable to complete the Coast Guard's mission. However, making mission execution more effective and efficient requires highly integrated, interoperable systems that can be expensive and often push the technological envelope.

A Blueprint for Acquisition Reform

The Coast Guard, like many other federal agencies, has faced intense scrutiny in the recent past for its efforts to execute and manage acquisition programs, particularly large, complex ones. The Coast Guard Deepwater program has been the subject of a number of Government Accountability Office reports, Department Office of Inspector General inspections, and congressional inquiries on its use of its system of systems acquisition strategy. Recognizing the weaknesses and responding to its overseers, the Coast Guard announced its Blueprint for Acquisition Reform in 2007, carefully outlining improved acquisition processes and aligning itself with the Service's modernization of mission support elements. Version four, now called the Blueprint for Continuous Improvement (July 2009), can be found at www.uscg.mil/acquisition/aboutus/blueprintv4.pdf.

The Coast Guard has achieved remarkable results since it asserted leadership in realigning its acquisition organization and its procedures. Among many notable accomplishments since enacting its own acquisition reform, the Service accepted the first mission systems pallet for its HC-144A "Ocean Sentry" Maritime Patrol Aircraft, a roll-on, roll-off

suite of electronic equipment that integrates multiple sensors and exchanges both classified and unclassified information with other assets. The Sentinel Class Fast Response Cutter project, removed from the Integrated Coast Guard Systems [*the private sector lead systems integrator for the Deepwater Program*] contract in 2007, was awarded in September 2008 with a full and open competition. On May 8, 2009, the Coast Guard celebrated the final acceptance of the 418-foot National Security Cutter *Bertholf*, the first of the eight Legend-class ships, and the ship received its authority to operate classified systems later that month. The second National Security Cutter, *Waesche*, completed preliminary acceptance in November 2009.

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Taking Control

The Blueprint for Acquisition Reform was a call for the Coast Guard to take control. The restructuring provided greater clarity in Coast Guard roles for project execution and support. With better role definition, Coast Guard's acquisition personnel were better able to execute their oversight role and to stringently monitor system development and deployment activities. The Coast Guard learned that oversight required full engagement and insight into the developers' processes, decision making, and quality control and assurance.

To provide a clearer characterization of its recapitalization efforts, the Coast Guard disaggregated its Deepwater system of systems acquisition into a number of smaller traditional projects based on single asset classes such as a cutter or an aircraft. The National Security Cutter and Maritime Patrol Aircraft are examples of asset projects that were spun off from the complex system of systems program. Single-asset project managers were chartered with cost-schedule-performance responsibilities, adding clarity and authority to a better-defined portfolio of acquisition initiatives.

To preserve the premise of acquiring capability through a systems perspective, the Coast Guard balanced the single asset projects with a new program office structure that had full purview of the acquisition of command, control, communications, computer, intelligence, surveillance, and reconnaissance systems. The C4ISR program focused on capabilities that are typically multifaceted and designed to be interoperable, integrated, and networked. The C4ISR program not only included existing projects such as Rescue 21 [*a program involving the upgrade of the Coast Guard's communications into a system that uses digital communications and voice over Internet Protocol*] and the Nationwide Automatic Iden-

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tification System [a system that will allow the Coast Guard to identify, track, and communicate with marine vessels using a new maritime digital communication system], but also the C4ISR systems acquired on aviation and afloat assets. The C4ISR program required all project sponsors and C4ISR technical authorities to acquire systems that were capable and sustainable within the service's enterprise architecture while complying with technical standards and policies.

The Coast Guard significantly improved its ability to acquire in an integrated fashion with rigorous, coordinated participation from its technical authorities and sponsors. Integration was achieved by each element of the acquisition enterprise executing its inherent responsibilities and competencies: the sponsor to clearly understand and articulate the need; the technical authority to express the standards, policies, and architectures for the solution; and the acquisition program manager to acquire within established cost-schedule-performance parameters. The collaborative team effort has produced considerable success.

The Service took more control in acquiring future integrated systems by improving system definitions and increasing the use of architectures. Where it made sense financially and functionally, it obtained the legal rights, design documents, source code, and interface descriptions in order to reduce dependence on single vendors, increase innovation, enhance future competition, and drive down life cycle costs. Through a well-defined architecture and comprehensive interface descriptions, the Coast Guard advanced its core competencies of systems engineering and systems integration and put itself in a better position to manage the acquisition.

Importance of Oversight

Some have questioned the Service's ability to exercise proper oversight of industry activities. In the past, while it employed readily accepted best practices and government standards for overseeing contractors, the Coast Guard still found itself a step behind in managing a dynamic systems acquisition. Since enacting acquisition reform, the Coast Guard has emphasized the use of recognized techniques and practices such as earned value management, technical interchange meetings, and formal progress and program reviews—all which have yielded very positive results. The Service has also worked to ensure that the contractors deliver the right information at the right time in order to reveal any potential shortcomings as early as possible and verify that the products will satisfy operational requirements, achieve technical standards, and realize cost-effective sustainment.

Perhaps the most important aspect of oversight and control is insight of the system development activities. It is important to ensure meaningful documents, coupled with program and engineering reviews, provide necessary information that will reveal the true status of the acquisition.

Through deliverables and reviews, the Coast Guard can gain an early glimpse of the health of the development effort. Rigorous testing as the asset or capability is finally delivered is important, but it is often too late to discover serious flaws. The assessment of system development artifacts and the physical presence at the developer's facilities provided the Coast Guard the necessary insight of the developer's quality control and decision processes that eventually impact the final solution. Only through insight does the program manager realize real oversight.

Lessons for Moving Forward

Stable Requirements

As the lead systems integrator, the Coast Guard has fully realized the importance of imposing stable, government-derived requirements on the developer and then exercising oversight over the development effort. While performance-based contracting remains a viable acquisition approach, the Coast Guard has been determining more specifications



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before entering into a contractual relationship, especially for complex systems. The contract should not only dictate the products and outcomes of the deliverables but should also require written developmental documentation and program reviews to provide timely information that is also necessary to ascertain the quality of services and products as early as possible. Program management activities such as design reviews, technical evaluations, and testing must occur early and periodically in an acquisition. Performance assessments near or at the end of the development or integration effort are a primary reason for cost growth and schedule delays.

Oversight Role

The oversight role is manpower intensive but necessary to carry out inherently governmental functions. An inadequate staff in numbers, experience, and qualifications caused problems early in the Deepwater acquisition, but the Coast Guard has made considerable progress in improving the situation. The Department of Defense encountered a similar situation, as its budget for goods and services nearly doubled in recent years. Secretary of Defense Robert Gates announced in April 2009 plans to hire 20,000 acquisition professionals by 2015. While Coast Guard acquisition is certainly not as large as DoD acquisition, it also will realize a significant boost with expected additional billets in fiscal year 2010. The Coast Guard has also successfully implemented a certification program that expanded its acquisition training opportunities and credentialing process to prepare technical staffs, project managers, and contracting specialists to oversee complex acquisition.

Off-the-Shelf Products

The Coast Guard has learned that the use of the commercial off-the-shelf and government off-the-shelf products, while effective and capable, is no panacea, especially for larger projects that require integration. No longer deploying capability in a standalone manner, the system integration effort in and of itself is a challenge and demands the rigor of sound systems engineering, including well-understood requirements that can be tested and verified. With constantly evolving cyber threats and interoperability concerns, integrating commercial off-the-shelf and government off-the-shelf components to adhere to information assurance certification and accreditation mandates has become increasingly complex and costly. The challenge of technology obsolescence and diminishing manufacturing sources must also be closely considered and planned for early on, as new functionality is introduced at regular intervals. With observed obsolescence periods of one to two years for many software components and a typical five-year period for many pieces of hardware, the Coast Guard is learning to anticipate degradation as it assembles plans to build evolutionary systems that consider changing interoperability requirements, address new cyber threats, and account for obsolescence.

Open Architecture

The Coast Guard is realizing the power of using open architectures to facilitate its role as the lead systems integrator. A primary goal of using an OA approach for developing integrated systems is the prospect that multiple private sector entities will participate in the acquisition, therefore enabling competition, innovation, and lower costs. When a single vendor manages the entire architecture and acquisition life cycle, the government can grow reliant on one industry entity to produce and support all of the capability, allowing the sole provider to design the architecture to employ its marketed products. The Coast Guard is aiming to take advantages of OA and use common software modules, employ multiple vendors, and invoke innovation. Inserting OA into the Coast Guard ethos will be challenging but necessary to deliver affordable systems in future.

A Systems Outlook

The Coast Guard has retained a systems outlook by employing program managers who have purview over a portfolio of related projects within their domains, specifically surface (cutters and boats), aviation (fixed and rotary wing), and C4ISR. Inherent in the C4ISR program is the opportunity to maintain a systems perspective by considering the enterprise and imposing common technology across the surface, air, and shore platforms, no longer allowing C4ISR products to be acquired in a stovepipe, unconnected manner. For example, the C4ISR systems developed for the National Security Cutter and the future Offshore Patrol Cutter will be overseen by the same C4ISR acquisition program manager, who will look to acquire common systems and sub-systems across the assets, thus simplifying maintenance and lowering life cycle costs. Moreover, the National Security Cutter, Maritime Patrol Aircraft, and the C-130J "Hercules" Long Range Surveillance Aircraft already have common products and use common software modules across.

In October 2008, the Acquisition Directorate achieved final operating capability when all of its program managers were physically collocated in the same building. Having all of the program manager proximate to one another generated synergies that encouraged common processes and eliminated redundant activities. As the Coast Guard refines its processes; hones the lead systems integrator relationships among the acquisition program managers, technical authority, and sponsor; and grows its workforce competencies and capacities, it must build upon the lessons learned during its acquisition reform. The Service must strive for insight of its acquisition efforts, as insight is the enabler for proper oversight and control in order to achieve success with complex acquisition programs.

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